

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
9 June 2005 (09.06.2005)

PCT

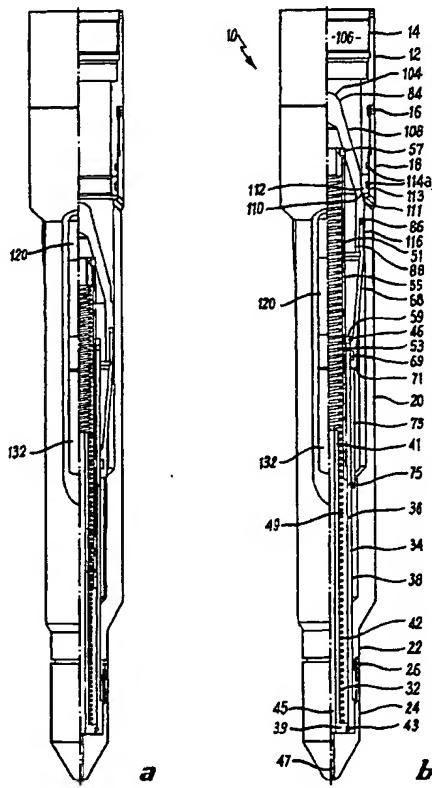
(10) International Publication Number
WO 2005/052313 A1

- (51) International Patent Classification⁷: **E21B 34/10**
- (21) International Application Number:
PCT/GB2004/004890
- (22) International Filing Date:
19 November 2004 (19.11.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0327021.2 20 November 2003 (20.11.2003) GB
- (71) Applicant (*for all designated States except US*): **RED SPIDER TECHNOLOGY LIMITED [GB/GB]**; Westhill Business Centre, Arnhall Business Park, Westhill, Aberdeen AB32 6UF (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **REID, Michael**,
- (74) Agent: **KENNEDYS PATENT AGENCY LIMITED**; Floor 5 Queens House, 29 St Vincent Place, Glasgow G1 2DT (US).
- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: IMPROVED VALVE

WO 2005/052313 A1



(57) Abstract: A valve for use in a downhole tool, the valve has an inlet (106) communicating with the work string from which it is anchored. The inlet provides a flow path of a first cross-sectional area. A sealing assembly comprising a spring biased seal cap (57) moves within an outer tubular body (84) to open and close a number of ports (120) arranged through the body. The ports provide (120) a flow path of a combined cross-sectional area greater than the first cross-sectional area and the valve is arranged such that fluid flow through the inlet (106) moves the seal cap to open the valve and create an unimpeded flow path between the inlet (106) and the ports (120) with negligible pressure drop. An embodiment including a shear ring (75) is described to facilitate pressure testing above. A further embodiment includes a load adjuster to assist in closing the valve. The valve can be a high lift injection valve.



- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*